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CENTRAL INTELLIGENCE AGENCY REPORT

## INFORMATION REPORT

COUNTRY Hungary

DATE DISTR. 5 Apr 1951

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Manufacturing Radios and Electronic Equipment, X-ray  
Apparatus, Incandescent Lamps, and Locks

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THIS IS UNEVALUATED INFORMATION

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- a. Orion Radio. Describing products of the Orion factory, including radio sets, precision telecommunication instruments (voltmeters, wavemeters, etc), and oscilloscopes.
- b. Hungarian Siemens-Reiniger plant. Manufacturer of X-ray apparatus.
- c. Tunggram Works. Manufacturer of incandescent lamps, radio tubes, etc.
- d. The Elzett Factory. Manufacturer of locks.

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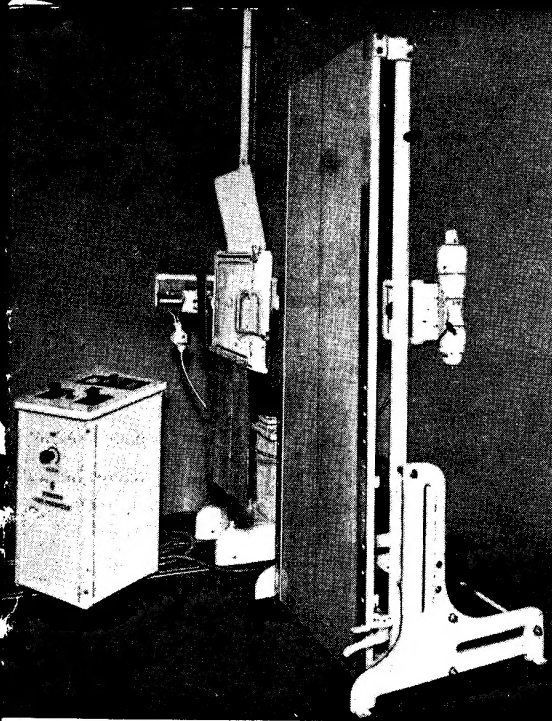
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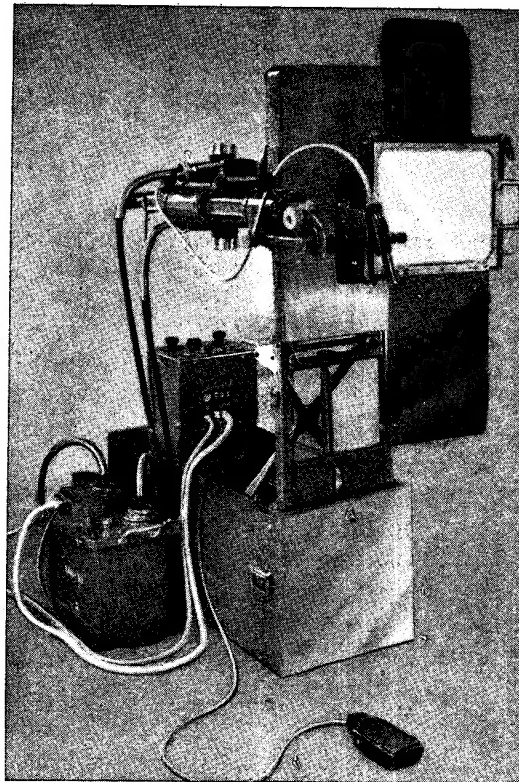


**THE PRODUCTION  
OF X-RAY APPARATUS**

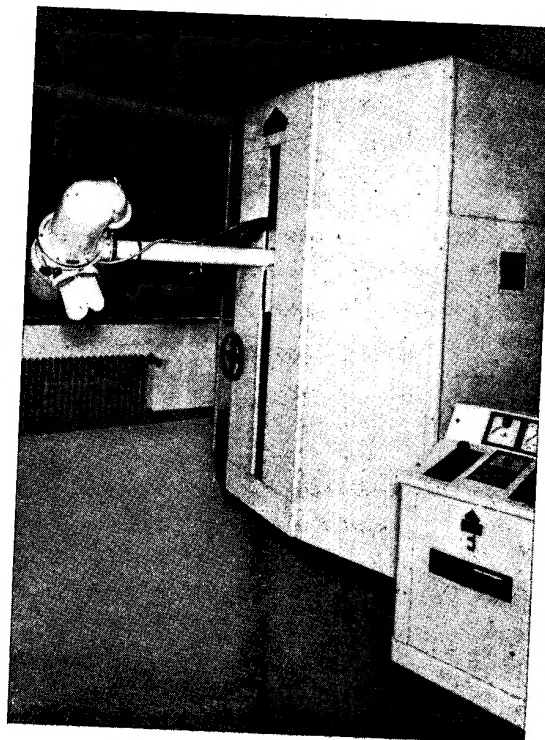
## AN IMPORTANT WEAPON OF PUBLIC HEALTH

Before the war, health reports published in Hungary, usually revealed tuberculosis as the most wide-spread peoples disease. It is a well-known fact that today the problem of overcoming this disease is primarily of a social rather than of a scientific nature as science has found the solution to it decades ago.

After the war the Hungarian health authorities were faced with a grave problem. It meant a difficult struggle, but the authorities took firm measures to liquidate this disastrous inheritance of the past. One of our most important weapons in the relentless fight against peoples diseases is the expansion of the mass X-Ray service. The progress made in this field up to now is clearly reflected in some data. While in 1940, X-Ray examinations carried out by tuberculosis institutes totalled 25,000, the corresponding figure for 1948 was 58 times higher: i. e. 1,450,000.



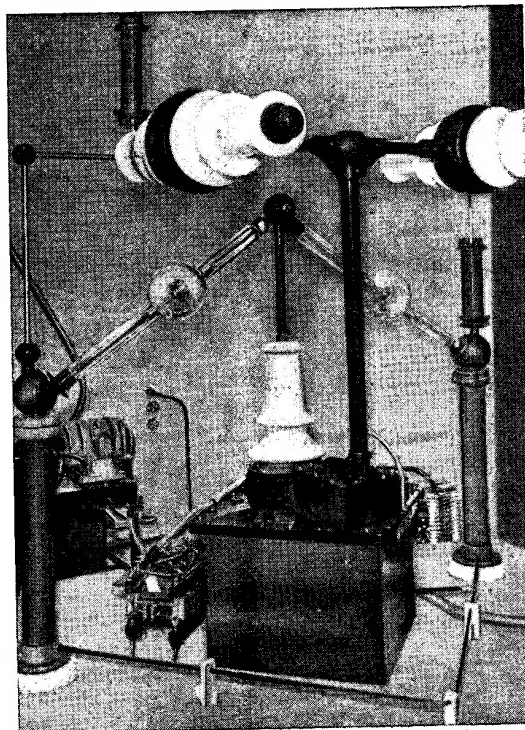
A number of hospitals and tuberculosis institutes were built and today 200,000 persons may receive constant tubercular treatment. The work carried out on a large scale has been rewarded with considerable success. The number of deaths from tuberculosis in Hungary decreased up to the present to one-third of the pre-war mortality rate. The Hungarian Siemens-Reiniger plant played an outstanding part in obtaining these favourable results. By means of their increased production of excellent X-Ray equipment they enabled us to considerably expand our mass X-Ray services. Among the stationary diagnostic units for therapeutic purposes, the Siemens **Auto-Progress**, X-Ray equipment proved highly successful and particularly well-suited for smaller hospitals. It has a double-focus X-Ray tube. For radioscopy, the smaller focus is switched on which yields a sharper, clearer picture (view), while in case of a radiograph the unit automatically switches over to the bigger focus with a higher permissible load. The adjustment of the radiograph tension simultaneously entails the fully automatic heating of the X-Ray tube correspond-



ing to the MA pertaining to the exposure tension, leaving only the exposure time to be fixed by means of a synchron-motor-operated contrivance.

The examining structure (the tilting examination stand, the sliding X-Ray tube and the fluoroscopic screen) can be adjusted to any desired position. The radioscopic tube current is freely adjustable to 3—5 MA. The apparatus is very popular, not only in Hungary but in other countries and overseas, as well, where many an apparatus of this type has been exported.

The requirements of bigger and of the largest type of X-Ray laboratories are met by the Siemens **Auto-Heliophos** equipment. This 4-valve radiography unit satisfies the most exacting demands. The apparatus (portable, on wheels or stationary) is produced in a series ranging from a 10 MA output to the fully automatic 4-valve unit with a 500 MA output. Their automatic regulation ensures perfect safety, and advantageous tube protection, excellent power, the considerable shortening of exposure time, simple and easy handling and the standardisation of exposure technique. A hand- or motor-operated examina-



tion stand, suitable for any purpose, can be delivered with the unit.

This apparatus, which is to a much higher degree automatic than the Auto-Progress, is manufactured for one- or twofold use. The one-purpose unit is equipped with the so-called **Telepanthoscope**, a universal examination stand, while the other unit is provided with the **Panthoscope**, which does not possess a special X-Ray tube stand. For the second purpose — for X-Rays taken of bed-ridden patients — either a moving table provided with Bucky's bars or a stratified X-Ray apparatus (the **Tomograph**) is obtainable.

There is a large variety of choice in appliances for therapy departments as well. Various units are manufactured, ranging from surface radiation to short-distance radiation and deep heat therapeutical X-Ray apparatus. They are easy and safe to use. Control devices assure safe manipulation. The portable **Portix** X-Ray equipment of the latest type has been specially devised to facilitate the work of the regional health departments. Its structure is of an equally high standard as that of the bigger units but, in accordance

with the special requirements, it is relatively light in weight, smaller in size, and is easily handled. Its output is barely less than that of the stationary X-Ray apparatus used in small nursing homes. When packed, it consists of three units, one case serving simultaneously as the examining stand. It is not only suitable for the radioscopy of patients in standing position but for patients in a horizontal position as well. Its highest output is 93 kilowatts and 60 MA. The tension of the X-Ray tube is adjustable in 8 positions.

The tube current is likewise adjustable within the given limits. The equipment is shockproof.

## MATERIAL-TESTING X-RAY UNITS

The Hungarian Siemens-Reiniger Plant manufacture in addition to therapeutical apparatus material testing X-Ray equipment as well. The equipment produced up to the present serves for rough structure examination and are of extreme importance in modern production technique.

The material-testing apparatus, called **Mobil M2**, serves for the X-Ray examination of larger objects. It is suitable for the radioscopy and for radiography of objects made of iron, with a 100 mm maximum thickness. The main characteristic of the unit consists in that both the high-tension transformer and the X-Ray tube are enclosed in an oil-filled and grounded metal case. The advantage of this arrangement is that the high-tension cables connecting the high-voltage transformer and the X-Ray tube — the cause of frequent breakdowns — are thereby eliminated. The standard output of the apparatus is 250 kilowatts and 15 MA.

For the examination of objects to which it is difficult to gain access — for instance bridge structures — the Hungarian Siemens-Reiniger plant devised another material-testing X-Ray equipment, the **Mobil M3**. The output of the latter is identical with that of the Mobil M2 but its mechanism is of a lighter finish. The high-voltage transformer consists of two units and the X-Ray tube is enclosed in a shockproof case. The flexible cable between the transformers and the X-Ray tube offers the latter a wide scale of possibilities for freedom of movement.

Those interested in any of the described products should address  
the ELEKTROIMPEX Budapest, V., Nádor-utca 21. (HUNGARY)

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**A VISIT TO THE  
ELZETT FACTORY**

ELZETT delivers hundreds of kinds of locks, padlocks, furniture and building fittings in large quantities to almost every country of the globe. Hungarian locks and padlocks are the guards of safety in city and rural dwellings alike.

The visitor, when entering the factory, ruminates on this success and certainly attempts to discover the reasons. In beautiful buildings modern machines produce — with up-to-date technique — merchandise which may be regarded as the tops of their kind.

*Mass production with high-precision requirements*

The factory turns out millions of articles yearly. Because locks has a rather intricate mechanism, with very small parts, the factory must deal with millions and millions of parts a year. Just the same, the parts are made within small tolerance limits and this is why the ELZETT products are nearly high-precision articles. This high quality has greatly contributed to the international success of the products. In short: the ELZETT products afford the maximum of safety that can be technically achieved at present.

Readers interested in any of Elzett products should address the  
FERUNION Hungarian Trading Co. for Technical Goods, Budapest  
53, P. O. B. 74 Hungary

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Published by the Hungarian Chamber of Commerce  
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Fv.: Béla Soproni

### *How a new type of lock is made*

Before the designing department sets out to draw up the plans for a new lock, for instance, information from ELZETT's own international market research is consulted. Once business requirements are known, these are brought into harmony with technical possibilities and a draft design is made. The next step is then the manufacture of a model of the new lock, which is given extensive tests. Not only are its technical merits scrutinized, but the item is sent around the factory and a veritable public opinion poll is held among the employees. Everybody expresses his opinion, and possible shortcomings are remedied. The final version of the new product thus becomes a marketable article, crystallized to perfection.

### *Trial manufacture*

Once the model is final, the manufacturing tools are made by the factory's own specialists. Manufacture is organized on the widest basis in accordance with mass production principles. The manufacturing process is under constant supervision and both parts and assembled products are tested with precision gauges.

### *Mass production*

When the trial manufacture runs without a hitch and the product is also faultless, mass production is started.

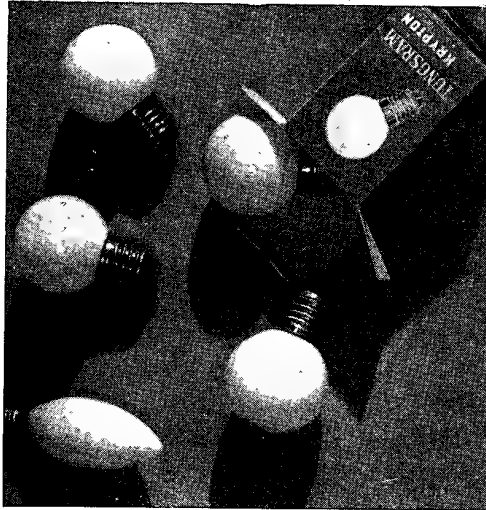
### *Checking the products*

The assembled locks are tested, opened and closed several times with their keys before delivery. With articles which require greater safety, e. g. the Tutius lock, not only is the final product checked, but its parts during manufacture as well.

This is how ELZETT's renowned types are made: the cylinder lock, the robust Gogi padlock, the Tuto padlock, — luckily for easy-going or forgetful people because when open, the key cannot be pulled out — then the rimmed safety lock, or the beautiful Tutius padlock.

In the courtyard, a multitude of neat, slender wooden boxes, ready for shipment, with various inscriptions such as Mombasa, Guayaquil, Teheran, Bruxelles, Buenos Aires etc. will meet the visitor's eye.





**T**HE STORY OF  
**THE TUNGSRAM**  
**PLANT**

It was in 1876 — 74 years ago — that a Hungarian electrotechnician, Béla Egger, set up a small plant in Budapest, out of which has grown the world-renowned Tungram Works.

To begin with, the plant produced bells and signalling-apparatus and later turned to the manufacture of other electric devices. The factory moved to new and larger quarters in 1887 and a few years later began the manufacture of the electric incandescent lamp for both domestic and foreign markets.

At the turn of the century it was necessary to enlarge the plant. It was then that the factory — which by that time bore the name of United Incandescent Lamp and Electrical Co., Ltd., moved to its present location, Újpest, one of the biggest suburbs of Budapest. The Tungram Works rapidly established its position on the world market, and right from the start kept abreast with the developments of modern technology. A significant amount of independent scientific research work was done within the plant itself. As a result,

*in 1903, the first wolfram filament incandescent bulb was produced in the Újpest plant which thus revolutionized electric lighting.*

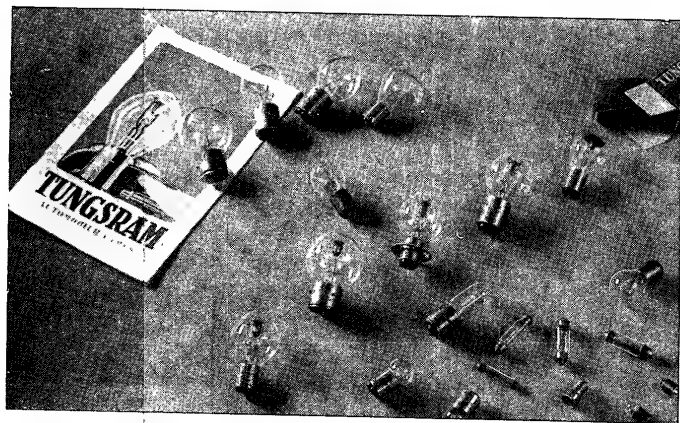
### **Tungram Research Laboratories**

The introduction of the radio in the first half of the 1920's involved another important development for the Tungram Works. Hungary also began to manufacture radio tubes and soon the Hungarian Tungram tube was as important an export article as the incandescent lamp.

With intricate technical problems increasing, it was found necessary to separate research work from the laboratories, and this resulted in the setting up of the Research Laboratory under Ignác Pfeifer, eminent professor on the Budapest University of Polytechnics. The Laboratory solved numerous scientific practical problems and among others

*worked out the process of extracting krypton gas from the air, as well as the economic serial production of krypton gas-filled incandescent lamps.*

That is how the Tungram Krypton bulb was born. Apart from giving a pleasant permanent white light, it is to this day — both from an electrical and optical viewpoint — one of the most economic incandescent bulbs yet known.



Production in the Tungsum Works has by now been entirely mechanized and brought up to date.

Tungsum Works itself produces the semi-finished goods needed for the manufacture of the bulbs and tubes (filaments, electrodes, grids etc.) and it is in its own workshops that the intricate automatic machinery is manufactured.

The Tungsum Works glass factory produces the glass tubes and stems needed for the incandescent bulbs and tubes, as well as the outer glass for the bulbs. Further, it also manufactures special ampoules and phials for the pharmaceutical industry. Both the bulb-blowing and the tube drawing equipment are entirely automatic, thus ensuring uniform quality.

In incandescent bulb and tube production the assembly departments, where work is also done mechanically on automatics, finish the Tungsum products and it is here that the difficult and ticklish task of assembly is performed.

There is great demand throughout the world for the high quality Tungsum products. There is practically no type of bulb in demand on world markets

which Tungfram cannot produce. Ordinary and ornamental Tungfram bulbs cover the standard illumination needs of households and public buildings. There are requirements in numerous other fields of both industry and every-day life which are met by other special lamp products of the Tungfram Works.

Along automobile, projection, photographic, decoration and train lamps we must not fail to mention the Tungfram pocket and torch flashlight, the radio dial lamp, the miner's lamp, the battery lamp and Christmas tree lights. The Tungfram switchboard lamps, owing to their large variety, can be used in almost all telephone central systems.

Tungfram keeps up with the developments of electric lighting also in the field of fluorescent illumination, which can be produced in all colours of the rainbow, and which brings artificial sunlight into the home.

#### **Tungfram in the service of world radio**

Tungfram tube production is one of the oldest and most important on the world market. An important step in Tungfram tube production was the birth of the miniature set. With these specially constructed batteryfed Tungfram tubes — consuming only half power — extra-small, almost pocket-size sets can also be manufactured.

Tungfram emission tubes used for medicinal purposes, powerful amplifier and rectifier tubes enjoy great popularity.

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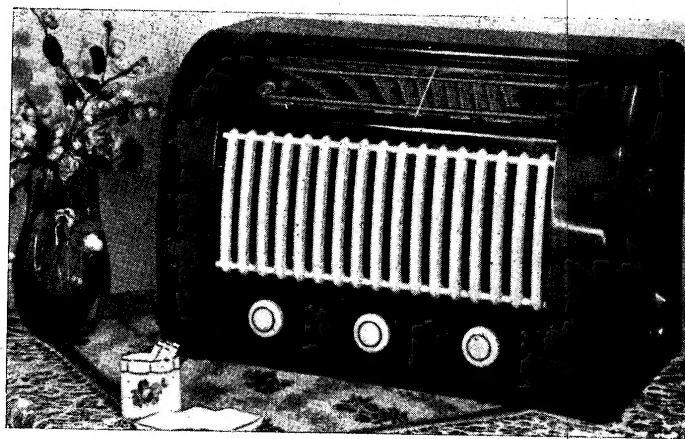
THE  
*Orion*

FACTORY IS OUTSTANDING  
IN THE MANUFACTURE OF  
RADIOS AND ELECTRONICS

Radio manufacturing, a traditional Hungarian industry, looks back upon a past of over 35 years. The Orion factory is the most representative among the Hungarian plants manufacturing radios. Its receiving sets are known and popular in various foreign countries, among them even in countries which have their own radio industry, as Holland, Sweden, Switzerland and France.

The secret of the success of the Orion factory is that it is able to honour the demands of its clients and supplies them with radio types which fulfil the requirements of their markets.

The Orion sets contain Tungsram tubes, which have attained world fame. Several types have been constructed, provided with the newest, miniature Tungsram tubes and all component parts built into the set are of very small size. The small size and weight demand lighter freight and duty expenses and thus facilitate export of the sets. All categories of Orion products, the small, medium, large and super-sets are able to compete with any other products on the world market. This is of great advantage to the commercial house selling them.



The Orion factory pays great attention to the servicing of its radio sets. The construction of the small and medium super sets is so simple and clear that after a short training not only radio mechanics but any other mechanic working in a related trade is able to repair it. The factory exports not only radio sets but also sets of component parts easily put together. The buyers are provided with all measuring and controlling tools together with complete instructions so as to enable them to assemble the various models.

Another most important field of activity of the Orion Works — besides the manufacturing of radios — is electronics: the design and manufacture of precision telecommunication instruments. As is known, the word "electronics" signifies the growing field of the industrial application of radio-valves.

The engineers of our Orion factory worked long hours for months on end after the day of liberation, in order to achieve and surpass the designing and production achievements of other most advanced technical organizations of our days, with the result that at this time we not only provide modern telecommunication instruments for our own modern radio industry, postal services, medical

research, radio transmitters and service organizations and for our constantly growing railroad communications, but we are even able to offer the fruits of our endeavour to the export trade.

Of the complete series of the Orion communication test equipments, we may mention at first those designed primarily for the fundamental radio laboratory, such as the Standard Signal Generator producing radio frequency signals for calibrating wireless sets on long, medium, and short waves to a precision on voltage and frequency which will meet the strictest requirements. The aural performance of radio receivers and loud-speakers may be tested to a high degree of accuracy with the use of Audio Signal Generators, furnishing 5 Watt energy at only 0.5% distortion. The Orion Vacuum Tube Voltmeters of various types serve to measure voltages occurring in communication, or other industrial equipment from direct current to above 100 Mc, hardly affecting the measured circuits in any way. For the measurement of the accurate wave length of radio transmitters, or local radio equipment, Precision Wavemeters from very long to ultra-short waves are offered.

Two of the most recent types of our Orion instrumentations are : the Wide-band Signal Generator, assuring 40 Volt output from 20 c/s to 5 Mc frequency range, thus serving satisfactorily the need for supersonic experiments and carrier telephone investigations ; and the Orion Ultrahigh Frequency Signal generator from 20—300 Mc, with continuous or impulse type modulation, a device employed to explore some of the frontiers of radio communications. It may be mentioned that for the investigation of the wideband circuits, such as are employed in television work, Impulse and Squarewave Generators are also among the products of the Hungarian electronic instrument industry.

Two Orion Oscilloscopes are in wide use at present : a smaller 3" model, capable of presenting audible and supersonic vibrations, and another, extending up to 5 Mc, well into the range of television frequencies. The use of these devices, particularly if connected to a so called "Electronic Switch" developed to observe two occurrences at once, renders very good services for the examination of mechanical and periodical phenomena in the machine building industry, in ship-building, in the railway service etc.

This industrial application of electronic instruments will obtain new impetus in our country through the introduction, at this time, of some additional industrial electronic devices, such as a new Orion Stroboscope, which shall enable the maintenance-man in a textile-plant to observe all operations of his machinery without stopping the spinning process for any length of time. In the flashing light of this instrument, he may freeze motion of all rotating or reciprocating components, and observe them in "slow motion". The results of this young and promising branch of Hungary's extending precision industry, give us new reassurance in forecasting great new strides in further development during the coming period by applying and expanding the result of advanced research to the growing needs of our country as well as of the increasing demand from abroad.

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